

1 **In the Claims:**

2 **1.—43.** (Cancelled)

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4 **44.** (New) A system for detecting a presence of cargo in a container,
5 comprising:

6 an ambient light sensor to determine if an ambient light level within the
7 container exceeds a threshold value;

8 a camera to obtain an image of an interior of the container;

9 an edge detection module configured to recognize lines formed by
10 intersection of floor and walls of the container, and to compare the recognized
11 lines to a plurality of images of empty cargo containers within an edge image
12 library, and upon failure to match the recognized lines to an image within the edge
13 image library, to within a threshold level of differences, to assume that cargo is
14 present within the container;

15 a laser unit, controlled by a projection pattern generator and operated only
16 when ambient lighting is below the threshold value, to create a laser projection
17 pattern in the container; and

18 a laser pattern evaluation module to evaluate the laser projection pattern to
19 determine if cargo is present in the container.

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21 **45.** (New) The system of claim 44, wherein ambient light below the
22 threshold results in use of an auxiliary light source while the edge detection
23 module is operating.
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1 **46.** (New) The system of claim 44, wherein ambient light above the
2 threshold results in operation of the edge detection module without an auxiliary
3 light source and prevents operation of the laser unit and laser pattern evaluation
4 module.

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6 **47.** (New) The system of claim 44, wherein the threshold value
7 associated with the ambient light level is set so that light levels equal to or greater
8 than the threshold value would reasonably allow personnel to work within in the
9 container.

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11 **48.** (New) The system of claim 44, wherein the edge detection module
12 compares the recognized lines to plural images within the edge image library to
13 determine differences, and where the differences with one image in the library are
14 less than a threshold difference, to assume the container to be empty.

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16 **49.** (New) The system of claim 44, wherein the edge detection module
17 evaluates the recognized lines for indications of cargo, including gaps, breaks and
18 distortions of lines formed by intersection of floor and walls of the container.

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20 **50.** (New) The system of claim 44, wherein the laser pattern evaluation
21 module evaluates two points of the laser projection pattern on the image having
22 similar Y-coordinates to see if a distance between X-coordinate values of the
23 points indicate alteration of the projection pattern by cargo within the container.
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1 **51.** (New) The system of claim 44, wherein the laser pattern evaluation
2 module evaluates the image for distortions and discontinuities not present in an
3 image of the projection pattern in the container obtained when no cargo was
4 present.

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6 **52.** (New) A method of sensing cargo in a container, comprising:
7 verifying that personnel are not inside the container by sensing an ambient
8 light level to determine if the ambient light level exceeds a threshold value and
9 assuming that personnel are not in the container if the ambient light level is below
10 a threshold;

11 operating an auxiliary lighting unit when the ambient light level does not
12 exceed the threshold;

13 obtaining an image of an inside of the container using a camera;

14 evaluating lines in the image formed by intersection of floor and walls of
15 the container for indications of cargo, wherein the evaluation compares lines found
16 by edge detection of the walls and floor in the image to an edge image library
17 comprising a plurality of images of empty cargo containers, and upon failure to
18 match the image to an image within the edge image library to within a threshold
19 level of differences, assumes that cargo is present within the container;

20 projecting a laser projection pattern into the container using a laser unit,
21 only when ambient lighting is below the threshold value and personnel are not
22 inside the container; and

23 evaluating the laser projection pattern to determine if cargo is present in the
24 container, wherein the evaluating selects at least two lines from the image of the
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1 projection pattern, measures a distance between those lines, and compares the
2 measured distance to an expected distance as an indicator that cargo within the
3 container disrupted the laser projection pattern.
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5 **53.** (New) The method of claim 52, wherein evaluating lines in the
6 image formed by intersection of floor and walls of the container for indications of
7 cargo also evaluates lines formed by double wall construction of the container.
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9 **54.** (New) The method of claim 52, wherein evaluating lines in the
10 image includes looking for gaps, breaks and distortions of lines formed by
11 intersection of floor, walls and double walls of the container.
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13 **55.** (New) The method of claim 52, evaluating the laser projection
14 pattern evaluates the image for distortions and discontinuities not present in an
15 image of the projection pattern in the container obtained when no cargo was
16 present.
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18 **56.** (New) The method of claim 52, wherein the evaluating the laser
19 projection pattern evaluates two points of the laser projection pattern on the image
20 having similar Y-coordinates to see if a distance between X-coordinate values of
21 the points indicate alteration of the projection pattern by cargo within the
22 container.
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1 57. (New) A cargo sensing system, comprising:
2 an ambient light sensor to determine if an ambient light level within a
3 container exceeds a threshold value;
4 a camera to obtain an image of an interior of the container;
5 an edge detection module configured to evaluate the image to recognize
6 lines formed by intersection of a floor and walls of the container and to recognize
7 indications of cargo, wherein ambient light below the threshold results in use of an
8 auxiliary light source while the edge detection module is operating, wherein the
9 edge detection module is additionally configured to compare results of edge
10 detection of the image to each of a plurality of images within an edge image
11 library associated with standard images of empty cargo containers, and upon
12 failure to match the image to an image within the edge image library to within a
13 threshold level of differences, to assume that cargo is present within the container;
14 a laser unit, controlled by a projection pattern generator and operated only
15 when ambient lighting is below the threshold value, to create a laser projection
16 pattern within the interior of the container; and
17 a laser pattern evaluation module to evaluate the laser projection pattern to
18 determine if cargo is present in the container, wherein the evaluation module
19 selects at least two lines from the image of the laser projection pattern, measures a
20 distance between those lines, and compares the measured distance to an expected
21 distance as an indicator of whether cargo within the container disrupted the laser
22 projection pattern.
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1 **58.** (New) The cargo sensing system of claim 57, wherein the threshold
2 value associated with the ambient light level is set so that light levels equal to or
3 greater than the threshold value would reasonably allow personnel to work within
4 in the container.

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6 **59.** (New) The system of claim 57, wherein edge detection module is
7 also configured to recognize in the image lines formed by double wall construction
8 of the container.

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10 **60.** (New) The system of claim 57, wherein the edge detection module
11 evaluates lines recognized at intersections of the floor and the walls for indications
12 of cargo, including gaps, breaks and distortions.

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14 **61.** (New) The system of claim 57, wherein the laser pattern evaluation
15 module evaluates two points of the laser projection pattern having similar Y-
16 coordinates to see if a distance between X-coordinate values of the points indicates
17 alteration of the projection pattern by cargo within the container.

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19 **62.** (New) The system of claim 57, wherein the laser pattern evaluation
20 module evaluates the image for distortions and discontinuities not present in an
21 image of the projection pattern in the container obtained when no cargo was
22 present.

1 **63.** (New) The system of claim 57, wherein the laser pattern evaluation
2 module evaluates the image by comparison to a projection pattern database having
3 images of empty cargo areas, and concludes cargo is present when differences
4 exceed a threshold value.

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